



KE's female Meter Data
Maintenance Officers (MDMOs).

Background

The South Asia Energy Unit of the World Bank¹ is working with researchers from the Harvard Business School (HBS) on a series of South Asia Gender and Energy Case Studies. The case studies will look to employ a data-driven approach, which measures the impact of gender diversity on technical and financial performance in South Asian energy sector utilities. In early 2020, this approach was piloted with K-Electric (KE), who graciously provided HR data and performance metrics for their employees and key business areas. The limited data indicate that gender diversity may contribute towards a positive organizational performance at KE.

What does the literature tell us?

The relationship between gender diversity and firm performance has been highly mixed. While some studies find a positive correlation between the two, others found a negative correlation or a null effect. The main difficulty is to identify a causal relationship between diversity and performance (as opposed to an association). However, a recent global study of 1,069 leading firms across 35 countries and 24 industries, found that gender diversity relates to more productive companies, as measured by market value and revenue, only in contexts where gender diversity is viewed as “normatively” accepted. In short, countries and industries that view gender diversity as important capture benefits from it. Diversity was a driver for these companies success.² Research also shows that women were 1.4 times more likely to receive critical subjective feedback during annual reviews, compared to their male counterparts. This indicates that women’s contributions to the overall company performance may actually be undervalued.³

1 The study team consisted of Fan Xia (Research Assistant - HBS) and Pranav Vaidya (Senior Social Consultant - World Bank), under the guidance of Letian Zhang (Assistant Professor - HBS), Faiza Savul (Head of Center of Expertise, HR- K-Electric) and Areeba Ali (Manager of Diversity and Inclusion - KE) graciously provided data and support.

2 <https://hbr.org/2019/02/research-when-gender-diversity-makes-firms-more-productive>

3 <https://hbr.org/2017/04/how-gender-bias-corrupts-performance-reviews>

K-Electric's push for Diversity and Inclusion

K-Electric (KE) has powered Karachi, one of the world's most populous cities and Pakistan's economic hub, for over one hundred years. Through a network spanning across 6,500 square kilometers, KE supplies power to over 2.5 million residential, commercial, industrial, and agricultural consumers. The company was privatized in 2005. KE is the only vertically-integrated power utility in Pakistan, managing generation, transmission, and distribution functions. In 2009, KES Power Limited, the majority shareholder of KE, put into place a turnaround strategy that has seen investments of over USD 2.1 billion, which is recognized globally as a story of business excellence. At K-Electric, the belief is in uplifting human values in everything they do. This is reflected in their corporate culture through the acronym CARES, which stands for Customer-centric, Accountable, Respectful, Energized, and Safe.

KE is committed to improving Diversity and Inclusion (D&I). The new management recognized that diversity and inclusion needed to be an important part of KE's modernization efforts to attract the best talent and have a diverse and productive workplace. The company initiated its ambitious D&I strategy in 2016. By 2022, KE pledged to i) have a workforce at least as diverse, if not more so, than any other in the industry, ii) meet set targets on increasing women workforce with a wider impact on women retention and empowerment, and iii) embed diversity in all activities by making it an ideology that everyone at KE understands and demonstrates.

KE has a target to achieve a 5% female workforce by 2022. This would be up from 3.5% at the time of writing. Towards this goal, the company committed to hiring an additional 172 women and has taken concrete steps towards improving women's empowerment and employment as part of their HR staffing policies, outreach, and operations. In 2019, KE became a WePOWER partner.⁴

The company is addressing the following key areas to improve D&I:

- Improve HR policies including updating the internal performance rating systems and promoting an inclusive succession planning structure. KE has instituted unconscious bias training for all managers and interviewers for recruitment. The company is also implementing an extensive role mapping exercise to identify growth opportunities to ensure that female-friendly roles across the company are marked and hiring and internal movements are managed accordingly.⁵
- Continue to invest in and develop new talent through internal development programs to embed diversity at the heart of the workforce. This includes recruitment and training of female staff in business and operations (see box on female Meter Data Maintenance Officers) and assigning female engineers across all key projects
- Improve the working environment for the women by adding facilities such as a separate washroom and prayer area, and common rooms in the integrated business centers (IBCs). They have also hired female janitors/security guards and provided transportation services, lactation rooms, daycare centers, health, and professional support for returning mothers such as nutritionists guidance Post-maternity mentoring for work-life balance.
- Increase outreach for female students including STEM awareness, scholarships for female engineers, apprentice, internship, and mentoring programs.

BOX: Female Meter Data Maintenance Officers at KE

In August 2018, KE launched Female MDMOs (Meter Data Maintenance Officer) Initiative; the pilot programme which recruited, trained and deployed four female meter readers. This was the first program of its kind in Pakistan and its success prompted KE to expand the initiative by hiring an additional nine female MDMOs in August 2019. KE is also helping to professional and personal development training for the female MDMOs, who belonged to under privileged backgrounds. Also, the women have been assigned additional responsibilities of data management and cold calling to consumers who are defaulters. This enhanced their professional skills outside the domain of their role as MDMOs.

The performance of the thirteen female MDMO's performance has been very positive. They have filled a crucial engagement gap for customers and female centric businesses, such as clinics and beauty parlors/salons where access for male counterparts may be restricted. The female MDMOs were able to improve actual meter readings, inspect and record correct appliance loads. This has reduce the number of consumers being billed on less accurate average basis, which has improved financial performance metrics for KE. We hope to continue monitoring the progress of this specific initiative with updated data soon.

- Overall year-on-year Quality of Billing improved by 9% between from April 2018 to 2019
- A 33% improvement in Quality of Billing for female centric business (from 61% to 93%) between December and January 2019.
- Recovery ratio for selected female consumers dramatically improved from 45% in Dec 2018 to 141% and 166% in Jan and Feb 2019.

⁴ www.wepowernetwork.org – please see progress update report for a full list of KE's commitments

⁵ Jobs are identified based on parameters like ease of available talent/experience in the market, physical attributes of the job, work timings etc. After identifying relevant jobs, hiring numbers were determined depending upon the current vacancies and business objectives.

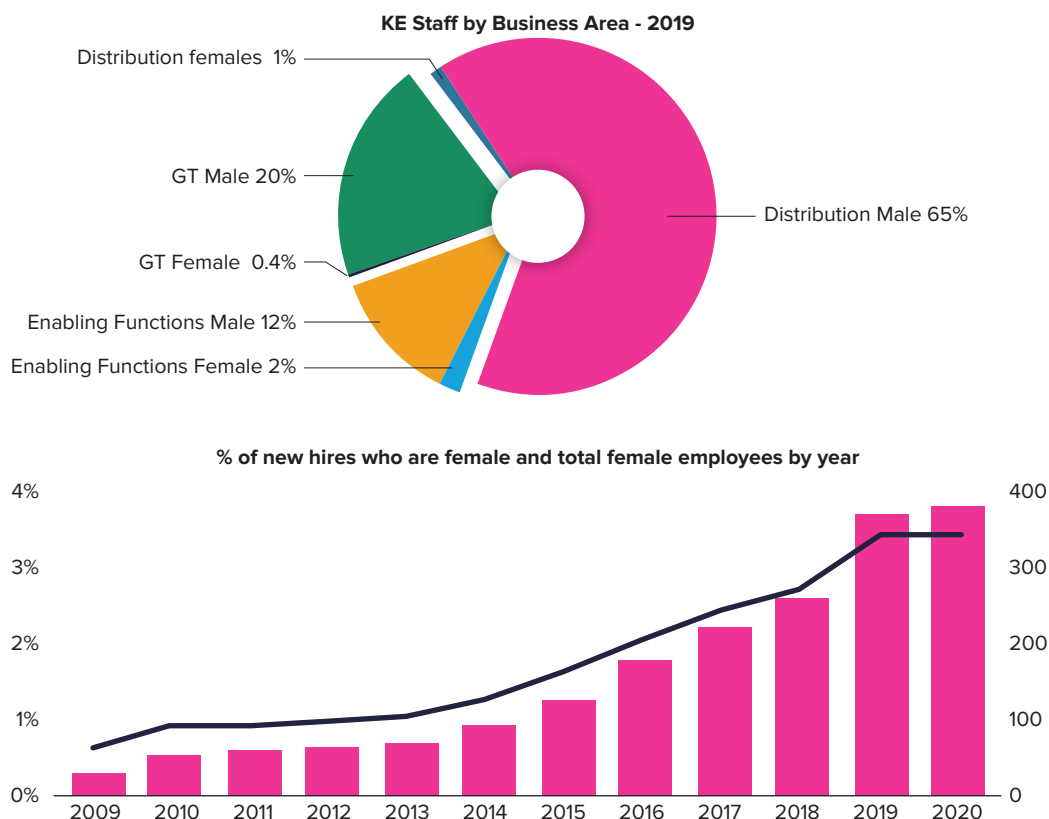
The Dataset

The data provided by KE was crucial for the study. KE shared 1) employee database and performance ratings from 2011-2018, and 2) Distribution Business Area - Integrated Business Center (IBC) level performance ratings for 2019. It covered 11,075 observations and various dimensions including education level, work length, job roles, etc. We used employee performance rating as our measure, which is an indication of Annual Performance Management based on company objectives. For the current dataset, although individual performance rating was provided from 2011-2019, the number of observations was limited (less than half) for women before 2016, since many have been recent hires. This inherent limitation limited the regression to a cross-sectional analysis using the 2017-18 figures.

The data collection exercise was a learning experience for both the researchers and KE. We were able to get a better understanding of the organizational structure, information collected for employees, and performance metrics and ratings/scorecard policies used by HR. This study was able to provide KE with i) additional insights into their gender profile and ii) guidance on improving their gender data collection and reporting requirements for monitoring their progress towards their D&I goals.

KE Gender Profile

Female employees accounted for **3.42% (379 out of 11,075)** of the total staff at KE in 2019 (this has improved to **3.5% in 2020**). Women are mostly based on enabling functions⁶ (n=204) while the distribution and generation and transmission (G&T) areas account for 34.6% and 11.6% of the total female staff, respectively. Overall, the percentage of females joining KE has increased. Corresponding with the D&I commitment by KE, there appears to be a surge of female joining in 2017. Women accounted on average, less than 6% of new hires before 2017. In 2017, this figure had jumped to 18%.



⁶ Enabling functions include non-technical positions in Business Support, Legal, Marketing, HR departments.



KE Energy Efficiency Campaign

Approximately 8.1% (199/2459) of management positions (assistant manager or higher) are held by females. Two out of six group heads who directly report to the CEO are women (marketing and communication, and strategy and supply-chain). Overall, 26.5% (100/379) of women are in mid-management (deputy manager) level positions or above. Most of the women managers work in enabling functions where they account for 13% of the total management staff.⁷ In the distribution and G&T business areas, these numbers are lower at 4.6% and 3.2% respectively. The largest group of women belong to customer care positions (49) and data processing jobs (19). Overall, the percentage of women getting promoted is increasing over the past 10 years. From 2009 to 2020, the percentage of female workers getting promoted has increased from 0.9% to 5%, whereas male workers have a relatively consistent promotion rate.

Women tend to hold more advanced degrees on average than men. Among women who are holding a degree, 68% of them are holding a technical degree (e.g., business, engineering, or science). Among men around 55% are holding a technical degree. This can point to the fact that women tend to stay in school longer and need to be better qualified to enter the job market. In Pakistan, men tend to have more access to practical field-level experience and internship opportunities.⁸

On average, men have worked at the company over twice as long as the women. Male employees have a service length of 7.5 years, whereas the service length for females is around 3 years. This gap is more pronounced by business areas. The average work length for women in distribution is about 3.8 years, whereas for men is around 8 years. In enabling function positions, the average employment length for a female is around 2.7 years, whereas for a male is around 6.4 years. In G&T, women have worked on average for 2.25 years, whereas for men, 6.5 years. This gives an indication of the hiring and retention for each business area within KE.

Retaining women remains a major challenge at KE. Between 2018-2020, despite hiring 63 women (33 in managerial positions), 44 women left the company. A closer analysis of the exit interviews revealed that that 62% left due to personal commitments such as marriage, relocation, and or family issues, and 30% resigned due to unsatisfactory experience working at KE. In contrast, for the 207 men that left the company during this period, 40% left due to personal reasons including higher education and starting their own business. The second highest cause (14%) was due to dissatisfaction with the low salary. Only 12% left due to work environment citing work experience/load/culture. The results show the stark gender differences regarding the pressures impacting employee attrition.

⁷ KE explained that this extraordinary situation is a result of the strong job pool of experienced women in higher support/enabling function roles.

⁸ World Bank. 2020. Pathways to Power : South Asia Region Baseline Assessment for Women Engineers in the Power Sector (English). Energy Sector Management Assistance Program (ESMAP). Washington, D.C. : World Bank Group. <http://documents.worldbank.org/curated/en/425391580298974587/Pathways-to-Power-South-Asia-Region-Baseline-Assessment-for-Women-Engineers-in-the-Power-Sector>

Looking for clues in the data – does gender diversity impact performance?

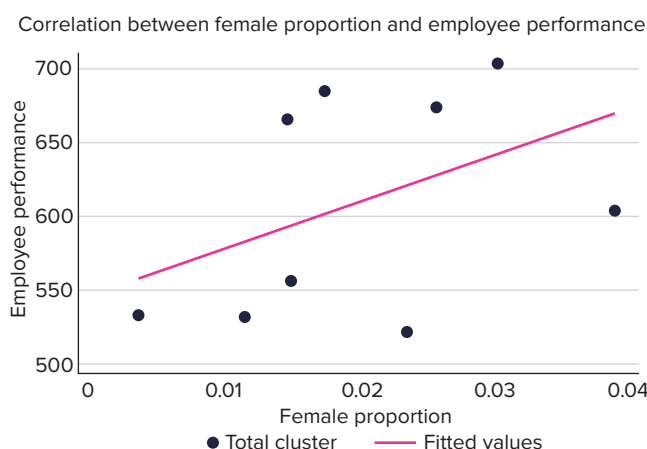
The gender profile helped to inform a limited cross-sectional regression analysis. We expect to find that improved gender diversity in the workplace would be associated with higher rated employee work performance. Based on the gender profile, we observed that females on average hold a higher educational degree compare to their male coworkers. Female staff also tend to have a significantly shorter service length compared to males (3 vs. 7.5 years for female and male). Moreover, both factors (education and service/experience length) are positively associated with employee performance rating. Thus, considering the provided data, we decide that those are the two important factors to control for in the regression analysis. A key logical assumption here is that better employee performance metrics equates to better organizational performance metrics.

$$\text{Model: Employee performance} = f(+\text{gender}, +\text{education}, +\text{service length})$$

The regression analysis was based on combining two datasets: 1) HR employee individual performance dataset, and 2) performance data from 10 distribution clusters consisting of 31 IBC (Integrated Business Centers) which are field-based. The regression analysis at performed at four levels reflecting the organizational structure of KE: i) all of KE, ii) company headquarters (HQ), iii) IBC cluster, and iv) IBC branch. Employee performance ratings (Below Expectations, Met Expectations, Exceed Expectations, and Outstanding) were converted into a numerical form between 1 to 4 for the analysis.

SUMMARY TABLE: KE HQ ANALYSIS	
Coefficient (Gender):	.316
R2:	.018
Adjusted R2	.0175
Standard Error	.081
P-Value	0.0000
95% confidence interval	[.156, .475]

Only in the company headquarter level analysis did we find the relationship between individual performance and the proportion of females to be significantly positive. Controlling for education and service length, the presence of a female employee is associated with a .32 increase in the individual performance score at HQ. This result held true regardless of the position and business area/department of the individual.⁹ The significant results for the HQ level regression is likely due to the larger sample size of female employees - 253 out of 379 (67%) females employees are concentrated in HQ. The remaining 33% of female employees at KE are spread out across the 31 IBC branches. On average, less than 10 female employees are working at each IBC branch. The low representation of female workers would likely make it difficult to have a significant impact on overall employee performance at the branch level.



⁹ The sample size was large enough for a regression analysis at the HQ level, but no so at the IBC and Cluster level. Outliers were examined and did not have a significant impact on the analysis. We also examined other variables across the cross-section (including employee performance across the business areas/units/departments), but the differences were not significant enough to impact the correlation. Robustness test and controlling for fixed effects was not required as the data did not allow us to establish a causal relationship. Controlling for fixed effects was unnecessary because the analysis is at individual level.



*KE Staff Sports
Tournament - Badminton
Winners*

Moreover, although the result does not show causation, we found that there's a moderate and positive correlation (0.125) between female presence and performance score at the IBC cluster level. Two additional regression analyses were performed: A positive but statistically insignificant correlation was found when examining the presence of female managers to individual employee performance scores at the IBC cluster and branch level. Second, we constructed a performance improvement score (from 2017 to 2018) and examined whether a greater proportion of female staff is associated with greater improvement in the performance. No such correlation was found.

Overall the results are promising but limited. It shows that when a larger proportion of female staff is present in the organization employee performance shows an upward trend. Moreover, the data suggest an association between the presence of the female employee and the individual performance score. However, we were only able to examine the performance score in 2018 due to the limited observations of performance rating for previous years – so we are unable to draw a causal conclusion. To observe change within organizations, using data across the years and compare employee performance before and after a policy/initiative/change is implemented, would give a more insightful understanding of the changes within an organization over the years.

Final thought and Future Work

To our knowledge, this is the first attempt to do a data-driven analytical gender study for a power utility in South Asia. We appreciate K- Electric being generous with their time and entrusting us with confidential internal data. The findings present a baseline and indicate that KEs commitment towards D&I have been rewarded with improved performance metrics for their female employees and distribution clusters. From our understanding of the literature and the KEs D&I reforms, the positive and significant correlation of the gender variable seems to indicate that the internalization of progressive policies at KE is taking place and could explain the positive and significant coefficient of the gender variable. The female staff at KE are also younger (have shorter service length) and tend to be top graduates from top universities, which may contribute them to be more motivated (given the obstacles women likely faced in joining the workforce). However, these are factors that may not be fully captured by the dataset.

The retention of female staff remains the biggest challenge for KE towards achieving their D&I goals. The data shows a large gender gap in overall employment in distribution and G&T positions. However, KE has done a remarkable job in filling the limited positions they have with women in managerial positions, with significant numbers in higher-level positions such as general managers. Although some factors like family/



KE Generation Plant - Bin Qasim Power Station (BQPS) II

marriage/household pressure may be beyond KEs control, focus group discussions with employees can help to explore solutions and incentives can help to improve retention.

We intend to build on this study with KE and the HBS and further strengthen the dataset and help to inform their D&I initiatives. Once the restrictions of the pandemic ease, we hope to do primary qualitative and quantitative data collection (interviews, focus group discussions, and surveys, either in-person or virtual) to provide additional context on dimensions of employee satisfaction, performance, and normative acceptance (a sense of positive belief or in the benefits of) of D&I principles. Some future questions include: How can the internalization of D&I principles (normative acceptance) be effectively fostered, monitored, and evaluated? Do employees have a higher performance of employees under female managers (the study found a positive but insignificant correlation)? What are the potential barriers to the advancement of KEs D&I goals? We can get closer to answering these questions by addressing some of the specific gaps concerning the HR datasets:

- **Collect additional longitudinal data. It does not have to be in consecutive years. However, we do expect it to include the pre and post period covering a policy implementation.** Additional data on employee satisfaction, wage data on salary, benefits, attendance, number of women taking maternal leave, etc. across employees and groups will provide a more representative reflection of gender equality at KE.
- **Improve the categories for each variable and reduce duplication in the dataset.** For example, the definition and observations of Group, Department, and Function overlap in the provided data. While this may reflect the complex nature of the organizational structure, this makes it challenging to do meaningful cross-sectional analysis to compare differences across groups. Further refinement of the dataset and internal classification for the HR dataset will be required.
- **Establishing a performance management system (PMS).** A PMS that systematically ties employee performance to department/business area performance will give a much fuller picture of the impacts of gender diversity. Considerate PMS principles for measurement and evaluation should work to reduce gender bias and subjectivity during the performance review. The current system is APA system utilized by KE is not so intuitive. How the APA is determined varies by each department/manager, and the methodology has also been updated in recent years. This makes it difficult to ascertain the qualitative differences between excellent, strong, and moderate performance. A better understanding of the changes will help us to control for the variations in the analysis moving forward.